REMARKS

Applicants thank the Examiner for the first complete examination of the instant application. Claims 1-4 and 6-36 are currently pending in the instant application. Claims 1-3, 6-7, and 16 have been amended, and claim 36 has been presented for the Examiner's consideration. Claims 1 and 23 are independent. Reconsideration of this application, as amended, is respectfully requested.

RESTRICTION REQUIREMENT

The claims of the instant application are restricted as follows:

I. Claims 1-22, drawn to a thermoionic cathode, classified in class 313, subclass 346R.

II. Claims 23-35, drawn to a method for making a thermoionic cathode, classified in class 445, subclass 50.

In response to the Examiner's restriction/election requirement, Applicants respectfully elect the Group I, which is drawn to a thermoionic cathode, with traverse.

Applicants respectfully direct the Examiner's attention to M.P.E.P. §803 which states:

> "If the search and examination of an entire application can be made without serious burden, the Examiner must examine on the merits, even though it includes claims too distinct or independent invention." (emphasis added)

There are two criteria for a proper requirement for restriction. The invention should be independent or distinct, and

> "2) there must be a serious burden on the Examiner if a restriction is not required. See M.P.E.P. § 803.092, 806.04 A through J, 808.01(a) and 808.02."

Applicants respectfully submit that the Examiner would not be unduly burdened if forced to examine both Groups I and II indicated hereinabove. For example, at least one of the patent documents relied upon by the Examiner (Frank et al.) includes both types of claims from the classes indicated in Groups I and II. See the claims of the indicated patent and the "Field of Search" section. This is direct evidence that the claims of the instant application do not present an undue burden for the Examiner such that a restriction thereof is required.

In accordance with the above, Applicants respectfully request reconsideration and withdrawal of the Restriction Requirement, and examination of all of the claims of the instant application.

DRAWINGS OBJECTION

The Applicants have submitted herewith a Drawing Correction Authorization Request (DCAR) for the Examiner's consideration. The DCAR includes Figure 5 with amendments shown in red ink. The amendment to Figure 5 adds reference numeral "114." The Examiner is respectfully requested to approve the amendment to Figure 5. In accordance with the foregoing, Applicants respectfully submit that the drawings objection has been obviated.

CLAIM REJECTIONS UNDER 35 USC § 102

Claims 1, 7, and 9-12 stand rejected under 35 U.S.C. § 102(e) has been anticipated by Saito et al., U.S. Patent No. 6,124,666. Additionally, claims 2-6 and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Frank et al., U.S. Patent No. 4,533,852. These rejections are respectfully traversed.

Independent claim 1 sets forth a combination of novel limitations including "a buffer, located between said substrate and said emissive layer, said buffer inhibiting interaction of said

emissive layer and said substrate by way of one of altering, blocking, and altering and blocking said substrate." Applicants respectfully submit that neither Saito et al. nor Frank et al. teach or suggest at least this novel limitation of independent claim 1.

Turning now to the Saito et al. patent document, taught therein is an electron tube cathode that includes a base 1, an alloy layer 4 and an electron emissive material layer 5. The alloy layer 4 is positioned between the base 1 and the electron emissive material layer 5.

The design of the electron tube cathode according to Saito et al. is distinctly different than that of the present invention inasmuch as the alloy layer 4 performs as an interface between the base 1 and the electron emissive material layer 5. Specifically, Saito et al. teach the base 1 is formed of mainly nickel, and includes at least one kind of reducing agent (column 3, lines 13-14). Saito et al. further indicate that "in addition to the reducing agent in the base, the alloy layer contributes to the supply of excessive Ba, and the alloy layer serves to ensure the stable supply of the reducing agent at the interface." (Column 4, lines 13-16.) Therefore, the alloy layer 4 cannot provide one of "blocking, altering, and altering and blocking," as does the buffer set forth in independent claim 1.

In accordance to the above, Applicants respectfully submit that it is clear that Saito et al. fail to teach or suggest the above indicated novel limitation of independent claim 1. Moreover, Applicants respectfully submit that Saito et al. teach away from the novel limitations of independent claim 1.

With regard to the rejected dependent claims, Applicants respectfully submit that these claims are allowable due to their dependence upon an allowable independent claim, as well as for additional limitations set forth by these claims.

In accordance with the above, Applicants respectfully request reconsideration and withdrawal of claim rejection under 35 U.S.C. § 102(e), in view of Saito et al.

With regard to the Frank et al. rejection, foremost, Applicants respectfully submit that the Examiner set forth an improper 35 U.S.C. § 102(b) rejection. In particular, the claims indicated as being rejected are claims 2-6 and 8. Each of these rejected claims are dependent upon independent claim 1, which was not rejected using the Frank et al. patent document. Therefore, for at least this reason, Applicants respectfully request reconsideration and withdrawal of the claim rejection in view of Frank et al.

In addition to the above, Applicants respectfully submit from even a cursory analysis of the Frank et al. patent document, it is clear that the disclosure therein fails to teach or suggest the novel limitations of independent claim 1. Accordingly, for this reason also, Applicants respectfully request reconsideration and withdrawal of the claim rejection in view of Frank et al.

In view of the above, Applicants respectfully request reconsideration and withdrawal of each of the claim rejections under 35 U.S.C. § 102.

CLAIM REJECTIONS UNDER 35 USC § 103

Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Saito et al. in view of Frank et al. In addition, claims 14 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Saito et al., and further view of Krijn, U.S. Patent No. 6,236,052. Additionally, claims 16-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Frank et al. in view of Saito et al. These rejections are respectfully traversed.

Each of the rejected claims are either directly or indirectly dependent upon independent claim 1. Accordingly, by virtue of this reason only, Applicants respectfully submit that the claim

rejections under 35 U.S.C. § 103(a) should be withdrawn. In addition, Applicants respectfully submit that the rejected dependent claims set forth novel limitations, which are neither taught nor suggested by the relied upon patent documents. Accordingly, for this reason also, Applicants respectfully submit that the rejections under 35 U.S.C. § 103(a) should be withdrawn.

With regard to the additional patent document relied upon by the Examiner (Krijn), Applicants respectfully submit from even a cursory review of the disclosure therein, it is clear that it fails to make up for the deficiencies of the Saito et al. and Frank et al. patent documents discussed in connection with the rejections under 35 U.S.C § 102. Accordingly, Saito et al., Frank et al., and/or Krijn, either stand alone or in combination together, fail to teach or suggest the novel limitations of the rejected claims.

In accordance with the above, reconsideration and withdrawal of the claim rejections under 35 U.S.C. § 103(a) are respectfully requested.

In view of the above amendments and remarks, Applicants respectfully submit that the claims of the instant application clearly define the present invention over the patent documents relied upon by the Examiner. Accordingly, reconsideration and withdrawal of the claim rejections are respectfully requested.

CONCLUSION

In view of the foregoing, Applicants submit that claims 1-3, 6-7, and 16 are patentable over the relied upon patent documents, and that the application as a whole is in condition for allowance. Early and favorable notice to that effect is respectfully solicited.

In the event that any matters remain at issue in the application, the Examiner is invited to contact Tim Wyckoff, Reg. No. 46,175, at (703) 390-3030 in the Northern Virginia area, for the purpose of a telephonic interview.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 50-1735 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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By T-Bk. ref #46,175
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JAC/TRW:kmh

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims

Please amend the claims as follows:

1. (Amended) A thermoionic cathode, comprising:
a substrate;
an emissive layer; and
a buffer, located between said substrate and said emissive layer, said buffer [modifying a grain structure at a surface of said substrate containing said buffer] inhibiting interaction of said emissive layer and said substrate by way of one of altering, blocking, and altering and blocking said substrate.

2. (Amended) The thermoionic cathode of claim 1, wherein said buffer [further] alters said substrate by randomizing a crystallographic orientation of [the] a grain structure at a surface of said substrate contacting said buffer.

3. (Amended) The thermoionic cathode of claim [1] 2, wherein said buffer by altering [further miniaturizing] miniaturizes grain sizes of grains at the surface of said substrate contacting said buffer.

6. (Amended) The thermoionic cathode of claim [5] 2, wherein said buffer [altering] alters the grain structure at the surface of said substrate contacting said buffer by at least one of dissolution, alloying, reaction, precipitation, and new phase formation.

7. (Amended) The thermoionic cathode of claim 1,wherein said buffer [is] blocks said substrate, said buffer being from a chemical class similar to a chemical class of said substrate.

16. (Amended) The thermoionic cathode of claim[5] 1, wherein said buffer blocks said substrate, said buffer blocking [the] a grain structure at [the] a surface of said substrate contacting said buffer by at least one of alloying, reaction, precipitation, and new phase formation.

Claim 5 is cancelled and claim 36 is new.